

Claims 1-17 Canceled.

18. (Currently Amended) A biosensor comprising:

- (a) a two-dimensional grating comprised of a material having a high refractive index, wherein the two-dimensional grating is comprised of a repeating pattern of shapes selected from the group consisting of lines, squares, circles, ellipses, triangles, trapezoids, sinusoidal waves, ovals, rectangles, and hexagons;
- (b) a substrate layer that supports the two-dimensional grating; and
- (c) one or more specific binding substances immobilized on the surface of the two-dimensional grating opposite of the substrate layer;

wherein, when the biosensor is illuminated a resonant grating effect is produced on the reflected radiation spectrum, and wherein the depth and period of the two-dimensional grating are less than the wavelength of the resonant grating effect.

19. (Canceled)

20. (Canceled)

21. (Canceled)

22. (Original) A detection system comprising the biosensor of claim 18, a light source that directs light to the biosensor, and a detector that detects light reflected from the biosensor.

23. (Original) The detection system of claim 22, further comprising a fiber probe comprising one or more illuminating optical fibers that are connected at a first end to the light source, and one or more collecting optical fibers connected at a first end to the detector, wherein the second ends of the illuminating and collecting fibers are arranged in line with a collimating lens that focuses light onto the biosensor.

24. (Original) The detection system of claim 23, wherein the illuminating fiber and the collecting fiber are the same fiber.

25. (Original) The detection system of claim 21, wherein the light source illuminates the biosensor from its top surface or from its bottom surface.

Claims 26-44 Canceled.